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NPIC/TSSO/DED-1664-69

MEMORANDUM FOR: Director, National Photographic Interpretation Center

SUBJECT: Request for Approval of [redacted] Change-in-Scope in Contract [redacted] for an Image Comparison Microstereoscope

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1. This memorandum requests approval for the commitment of additional funds for an existing contract. The specific request is stated in Paragraph 7.

2. Under this contract NPIC is developing a prototype instrument, which, through a system of optical and mechanical switching, will allow a P.I. to view various combinations of film chips from up to four different reconnaissance missions or sensors. The different comparison techniques available include three stereo (mechanical alternating stereo, electrical alternating, stereo, and split field stereo) and five non-stereo (split field mono, superimposition, Mask Edge Scanning, flicker, and color comparison). The detection of significant target changes will be enhanced with these comparison techniques, plus optical adjustments of magnification, anamorphic correction, and image rotation in the Image Comparison Microstereoscope (ICM).

3. The ICM will contain four film chip stages and four optical paths. Subsequently, the images are displayed binocularly in various combinations, and rapid switching between the four optical paths is inherent in the design. The Development Objectives and the Design Plan of this instrument require stage indicators visible to the operator in the field-of-view so that he can rapidly differentiate between the four images thereby permitting him to know, at all times, which of the stages he is viewing. The design selected called for a pattern of one, two, three, and four dots -- each of which are engraved or photo-deposited on a glass plate mid-way in the optical system at an intermediate image plane. It was hoped that these dots could be displayed in color to better differentiate between the images being successively (or in combination) displayed to the P.I.

4. Because of the compact design of this instrument, illumination of the indicator plates is provided by the high intensity lamps beneath

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the film chips. With these light sources transmitting light through the indicator plates, any color used for the indicator dots would appear black. Furthermore, engineering restraints, requiring the placement of anamorphic and image rotation prisms between the eyepieces and the indicator plates, mean that the indicator dots must automatically adjust to the zero power plane of the anamorphs and can, therefore, fall anywhere in the periphery of each field. Consequently, the dot pattern indicators will be difficult to pick out against the background of variegated black and white imagery on the four stages.

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5. Therefore, the Project Officer has obtained a quotation from [redacted] to change the design of the stage indicator "engravings" to discrete digits: 1, 2, 3, and 4. Each digit will be approximately 0.5 - 1.0mm in height. Engineering analysis will be required to determine the specific height, width, spacing, and line weight necessary for optimum visibility and minimum interference with the imagery. However, preliminary analysis indicates that the engravings (or photo depositions) on the four individual plates will be designed so that all of the digits will fall in the outer 20% of the field at all magnifications and through all adjustments of the anamorphs.

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6. [redacted] estimates the additional effort to finalize the dimensions, redraw the engineering drawings, and engrave or deposit the discrete digits on each plate will cost [redacted] more than presently budgeted for the dot pattern design. This figure includes engineering labor, manufacturing labor, overhead, G&A, and target award fee. Coordination has been effected informally by the Project Officer, [redacted] with IEO and TSSO/SSD. Overall project coordination will continue with all appropriate Center elements.

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7. It is requested that approval be granted to pay [redacted] form FY-1969 R&D funds for the above described change-in-scope to Phase II of the Image Comparison Microstereoscope development.

[redacted]
Chief, Technical Services & Support Group
MPAC

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APPROVED: _____
ARTHUR C. LUNDAHL
Director
National Photographic Interpretation Center

Date

Attachments:
1. R&D Catalog Form
2. [redacted] Letter
3. ICM Reticle Changes - Cost Analysis

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Distribution:
Original - NPIC/TSSG/C&FS (After Approval) w/atts
1 - NPIC/OD&r
1 - NPIC/TSSG
1 - NPIC/TSSG/C&FS
1 - NPIC/TSSG/DED

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NPIC/TSSG/DED/SRB [redacted] (16 JUNE 69) (02017)